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IN THE

Supreme Court of the United States

OCTOBER, 1964

No. 1180 [redacted] 154

SERVO CORPORATION OF AMERICA,
Petitioner,

v.

GENERAL ELECTRIC COMPANY,
Respondent.

RESPONDENT'S BRIEF IN OPPOSITION TO PETITION FOR WRIT OF CERTIORARI

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June 18, 1965

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This is an ordinary patent infringement suit in which the Court of Appeals' holding of invalidity was soundly based on the Court's determination that the subject matter (a particular manner of mounting an infrared hot-box detector) did not meet the statutory requirement of unobviousness (35 U. S. C. § 103).

The opinion of the Court of Appeals is reported at 337 F. 2d 716 and the portions which are pertinent to the petition are reproduced at pages A1-A9 and A19 of the Appendix to the petition.

No unusual question of law is involved. Nor is there any conflict with any decision in any other Circuit. Opportunity exists for litigation on the patent in other Circuits, for there are actual or potential rival manufacturers of hot-box detectors in several other Circuits and potential users (the railroads) can, of course, be found and sued in every Circuit.

Not only is the ground of the Court's decision sound, but the same ultimate result of invalidity would be required on at least two other grounds which the Court of Appeals did not reach. (1) The applicants did not disclose to the Patent Office the best mode contemplated by them of carrying out their alleged invention, as required by 35 U. S. C. § 112. (2) The only claim of the patent directed to the toed-in, upwardly-inclined mounting position which has been used commercially is invalid because detectors so mounted were on sale, sold and in commercial use for more than a year prior to the applicants' first disclosure to the Patent Office of that mounting position and their first assertion that it was part of their alleged invention. The claim is, therefore, invalid under 35 U. S. C. § 102(b) and *Muncie Gear Co.* v. *Outboard Co.*, 315 U. S. 759 (1942).

The Court of Appeals' Decision Is Plainly Right.

The desirability of effective hot-box detectors is undisputed. But that does not render patentable each and every detail of the first infrared hot-box detector to achieve commercial acceptance. One must examine closely just what it is that is claimed to constitute the "invention" of every patent, and indeed of every separate patent claim. *Altoona Theatres* v. *Tri-Ergon Corp.*, 294 U. S. 477, 487 (1935), rehearing denied 294 U. S. 734 (1935).

The heart of the railway hot-box detectors made by the parties to this suit is the thermistor bolometer, a heat-sensitive cell invented by scientists connected with the laboratories of the Bell Telephone organization. Such bolometers became commercially available about 1950 and made possible the production of a number of products which depend upon the ability to sense the temperature of remote objects, including the hot-box detectors with which this suit is concerned. Both parties are licensed by the Telephone Company under its patents relating to such bolometers.

In substance, a thermistor bolometer consists of a pair of small flakes of metallic oxides whose electrical resistance varies inversely with their temperature.

Two such flakes, one active and one inactive, are used in a bolometer. Infrared radiation from the object whose temperature is of interest is focused on the active flake by an optical system similar in function to what is used in an ordinary telescope or camera. The inactive flake is shielded from radiation from any external source. The two flakes are mounted in opposite legs of a bridge circuit in such a way that when the temperature of the active flake is raised by radiation from the object under examination a current indicative of the temperature of the object is caused to flow. This temperature-indicating current is amplified and used to actuate a recording pen. In this way a graph is made indicating the relative temperatures of the journal boxes on each side of the train as they pass through the line of sight of the detectors located on each side of the track.

In order to avoid cluttering the graph with indications of the temperatures of other portions of the train which pass through the detector's line of sight, the instrument is "gated," i.e., the temperature-indicating current from the bolometer is connected to the recording pens only when a journal box is in the line of sight and is disconnected at other times. This is done by an electrical pulse which is generated each time a wheel passes through the field of a magnetic "wheel-trip" attached to the rail at the proper place.

The patent in suit (946a-953a) correctly treats everything thus far described as having been already developed by others; the patent assumes the existence of such apparatus and is concerned solely with the question of where

such a detector should be mounted and how it should be aimed.

It is the thesis of the patent that prior to the joint activity of the patentees, Gallagher and Pelino, engineering employees of plaintiff, Servo, all efforts to make a satisfactory detector had failed because the prior detectors had been mounted at journal box height and aimed inward at right angles to the track with the result that the parts of the journal boxes which passed within their view were the hinged inspection or access lids on the ends of the journal boxes. These lids, the patent correctly says, are not a suitable target at which to aim the detector because they are attached with varying degrees of looseness, are sometimes open and sometimes completely missing. Therefore, the heat graph produced by a detector aimed at the *ends* of the journal boxes from a position at right angles to the track will not reflect with any accuracy or regularity the temperature of the journal bearing itself, which is the real subject of interest. Thus, claim 1 of the patent in suit (952a) represents it to be the invention of the patentees to aim the detector *at any portion of the journal box other than the lids*. It is now established that the inadequacy of the lids as a target for the detector was pointed out to plaintiff, Servo, by railroad representatives with whom the Servo engineers consulted and was therefore not any part of their invention (2.297, 3.10).

Once the inadequacy of the lids as a target was understood, it was readily apparent to any interested and discerning observer that the *sides* of the journal box, near the top to which the journal bearing itself was physically attached, are the parts best suited to give an indication of the journal temperature. Despite the original pretensions of the patent, the selection of the side of the journal box as the target is no longer claimed to be part of the "inven-

tion." Plaintiff's counsel has made this amply plain by saying:

> "We are not trying to get any credit for finding the right spot to look. What we are taking credit for is when it became apparent that this was probably a good spot to look. We picked out the way to look at it." (3.154)

Thus the only "problem" which the patentees now purport to have solved was where to mount the detector and how to aim it in order for the detector to see the side of the journal box which others had selected as the proper target.

Clearly, an instrument aimed at right angles to the track in such a way as to see the lid on the *end* of the box cannot see the sides of the box; to see the advancing side of the box the instrument must be pointed at least partly against the direction in which the train is moving; to see the receding side of the box the instrument must be pointed at least partly in the direction in which the train is moving.

Turning now to the question where such an instrument could or should be mounted, it is at once apparent that no instrument can be mounted *directly in the line of travel of the journal boxes,* for the instrument would be smashed by the first journal box to come along. One is, therefore, forced to mount any such instrument somewhere other than in the line of travel of the journal boxes—*below it or outside of it or both.* All possible mounting positions from which the sides of the passing journal boxes can be observed without being smashed are covered by one or another of the patent claims, even the location at journal-box height which is in violation of the railroads' safety regulations.

The "solution" of this "problem" which is covered by claim 5 of the patent (952a) was to mount the detector at the trackside below the level of the journal boxes and aimed parallel to the track at an upward angle so that the side of each journal box as it passed by would pass through

the detector's line of sight. The mounting position and aiming angle referred to are shown in elevation in Figure 2 of the patent which is reproduced below; they are shown in perspective in Figure 1 which is also reproduced.

Fig 2.

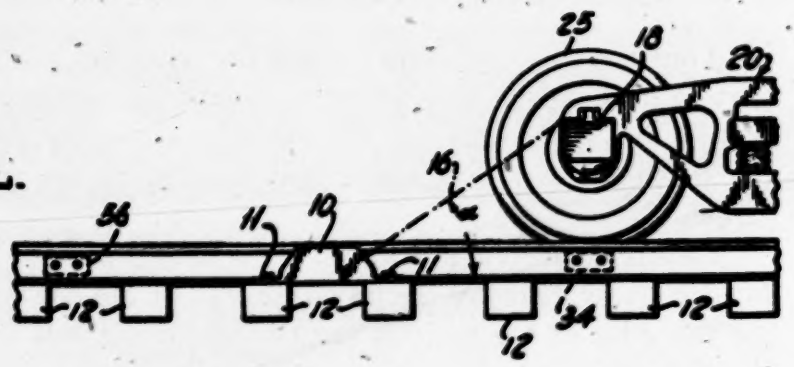
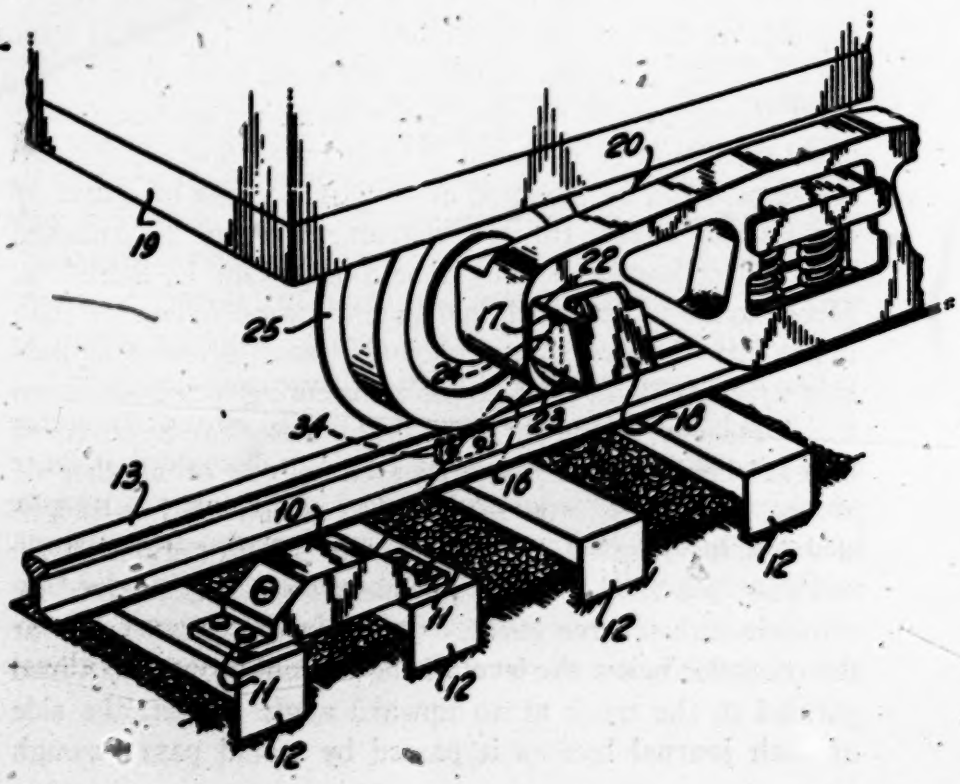


Fig 1.



In attempted support of the patentability of claim 5's low mounting position with a resulting upwardly inclined viewing angle, it was urged that when so mounted the detector was shielded from views of the sun and sky by the car bodies which overhang the journal boxes. But, as the patentees quickly found when they installed their first commercial detectors in this position, the detectors *did* see the sky past certain types of cars (such as tank cars which have no overhang) or over the ends of other cars (such as unloaded flat cars). The claims directed to this parallel-to-the-track mounting position, such as claim 5, were held invalid because "either disclosed or obvious from the prior art" (A8).

To avoid seeing the sky over the ends of unloaded flat cars a more-nearly horizontal line of sight was called for, but with a parallel-to-the-track mounting the presence of a structural member of the truck frame (the spring bolster) precluded such a lowering. To avoid seeing the sky past the sides of tank cars, an inwardly angled line of sight was called for. To angle the line of sight inward required that the instrument be moved to a position further away from the track. The moving of the detector outward and the angling of the line of sight inward brought the line of sight outside the spring bolster which had previously required a sharper upward angle. This permitted the line of sight to be lowered so as to avoid seeing the sky over the ends of unloaded flat cars.

Thus, by moving the detector slightly further from the track and aiming it at an inward and less-steep upward angle, the detector was enabled to see the sides of passing journal boxes without being exposed to the sky past the sides or over the ends of cars.

The adjustments just described were readily and routinely made by the patentees, with collaboration of railway

engineers, within a few months after the sale and installation of Servo's first detectors.

In support of the patentability of this mounting position, with its upwardly and inwardly inclined line of sight which ultimately became the subject of claim 6 (952a), it was urged that this mounting had the virtue not only of avoiding any possibility of seeing the sky but also was such as to avoid seeing any source of heat other than the journal boxes, such as brake shoes, rims, steam pipes, refrigerator condensers, etc., with the result that the underside of the successive cars would constitute a "quiescent background" reference against which the temperature of the journal boxes could be observed and evaluated.

It is true that when the detector is aimed at the proper upward and inward angle, it derives some protection from the possibility of being exposed directly to the sun, and exposure to miscellaneous extraneous heat sources under the train can be minimized, but the patent is not limited to any particular upward or inward angles; and even when mounted in the optimum position thus far determined, the detectors of both parties are exposed to the sky in some instances and are exposed frequently to extraneous heat sources underneath the cars. In addition to occasional direct views of the sun itself, a detector mounted in the optimum position is frequently plagued by sunlight reflected off the journal box itself. For protection against the adverse effects of exposure to direct or reflected sunlight the detectors of both parties are equipped with filters or lenses of materials such as arsenic trisulfide or germanium. The effect of exposure to extraneous heat sources underneath the cars is minimized in the detectors of both parties by causing the output of the bolometer to be connected to the recorder only when a journal box is in the line of sight, i.e., by "gating," as explained above.

Thus, the argument by which plaintiff has sought to impart patentability to the mounting position of claim 6, with its upward and inward angle, by establishing that it involves some extraordinary result, stands thoroughly exposed. And on the contrary, it stands fully established that the mounting position of claim 6 involved nothing more than routine adjustments which would have been, and were, obvious to persons skilled in this art at the time the alleged invention was made. The patent was, therefore, properly held to be invalid for lack of the quality required by § 103—unobviousness to persons skilled in the art at the time. The Court of Appeals was entirely correct in its dispositive statement that:

> ". . . It is the toed-in position described in claim 6 which is the crux of Servo's patent. The so-called invention involved in the toed-in angle of claim 6 was a natural and obvious successor step to the track-level-parallel to the track position of claim 5. Thus the act of Servo in taking one of the known positions disclosed by the prior art and moving the device outwardly from the rail, so as to accommodate the geometry of the truck frames of railroad cars, was not invention; this modification was an ordinary engineering matter obvious to one skilled in the art. Having reached this conclusion, the claimed advantage that the position chosen allows the device to see only the quiescent background of the underside of the car will not render an otherwise unpatentable method patentable." (A9)

Further Grounds of Invalidity

In addition to being invalid for obviousness, as the Court of Appeals held, the patent is invalid for additional reasons not reached by the Court of Appeals.

1. The Entire Patent Is Invalid Because the Patentees Failed to Disclose to the Patent Office the Best Mode Which They Contemplated of Carrying out Their Alleged Invention.

At the time the original application for the patent in suit was filed (November 6, 1956), the applicants had not yet learned that improved results could be obtained by toeing the detector in and lowering its line of sight. Accordingly, the closest approach in the original application to the mounting position which was ultimately adopted was a track-side mounting aimed parallel to the track and at a sharply inclined upward angle (about 35° above the horizontal), the mounting shown in Figs. 1 and 2 of the patent, which are reproduced above (*supra*, p. 6).

In adjusting, in the spring of 1957, the detectors sold to the Chesapeake & Ohio Railroad and to the Reading Railroad, the patentees found that improved results could be obtained by toeing the detectors inward and reducing the upward angle from about 35° to about 25°. Thereafter such a toed-in, lowered-angle mounting constituted, and continued to constitute, the best mode contemplated by the patentees for practicing their alleged invention. Under 35 U. S. C. § 112 they were obliged to disclose it in their application.

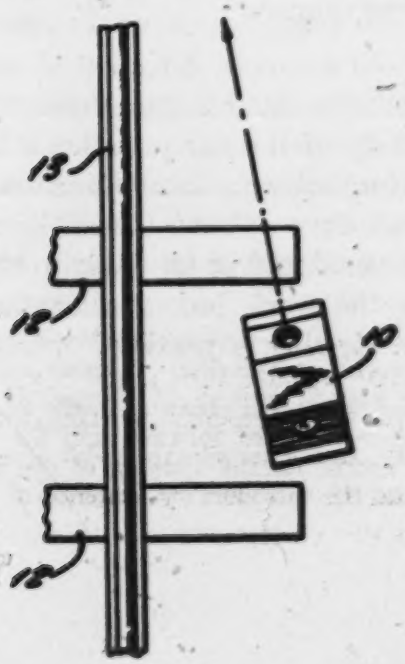
But when the applicants filed a continuation-in-part application to add the toed-in mounting to their disclosure and claims (which they did on June 30, 1958), they carefully refrained from disclosing the main point of the toeing-in (that it permitted reducing the vertical angle of the line of sight from 35° to about 25° so as to avoid seeing over the ends of cars) and instead reiterated the disclosure of the original application with regard to the vertical angle, namely, its statement that the upward angle should be "preferably of the order of 20 to 50 degrees" from the horizontal, and that "very satisfactory results" were obtained "when the viewing angle was approximately 35 de-

grees in the viewing plane which paralleled the adjacent track" (4.193-4.194). By reiterating their praise of a mounting position which had already been abandoned as unsatisfactory, the applicants made a good start toward non-compliance with their statutory obligation to disclose the best mode they contemplated.

Continuing, the continuation-in-part application added diclosures of various other possible "aspects of viewing," including between the rails and aimed at an upwardly inclined angle at the wheel-axle junction (Fig. 8) and between the rails and aimed vertically upward at the same target (Fig. 9).

In Fig. 10 (which is reproduced below) the applicants finally reached the point of disclosing the toed-in mounting, but instead of disclosing the 25° upward inclination which was in fact the "best mode" which they then contemplated they included only a plan view (a view looking down from above) which showed only that the detector was toed in and showed nothing as to its upward inclination.

Fig. 10.



Far from revealing that they had long since determined that with the degree of toe-in shown an upward inclination of 25 degrees produced the best results, they said that

> "Fig. 10 is a plan view of a detector mounted at an acute angle relative to the track *for either horizontal plane aspect viewing or slant aspect viewing.*" (4.192)

When it came to discussing the toed-in mounting, the application continued its failure to reveal what was in fact the best mode known and indeed went to some pains to avoid revealing it, by saying:

> ". . . the detector 10 is mounted at an angle, for example 10 degrees, to the track *and either at track level or between track level and the plane of the journal box.* With the detector 10 at track level, *there is little real difference between the two embodiments* [the parallel-to-the-track and the toed-in versions]; however, with the detector elevated to a position between the track level and the plane of the journal box, there are several real advantages in this embodiment.
>
> "For example, detection of sun reflections is less likely *with the horizontal-plane viewing.* Further, the body of the car provides a background for the detector, *whereas in slant-aspect viewing the background very often is sky.* Moreover, with the detector mounted at an angle to the track and raised from the track bed, greater flexibility of vertical angle viewing is possible." (4.195-96)*

*The discussion quoted above as to the advantages of horizontal-plane viewing was carried forward into the patent (952a, Col. 7, lines 36-45); except for the addition of the italicized words, which follow, to make the introductory sentence of the last paragraph of

True, the 10° angle which had been determined to be optimum was mentioned, but merely as an "example," and this was coupled with the statement that with the detector at track level (where it has in fact remained) there is "little real difference" whether the detector is toed in or left parallel to the track. And far from revealing that the applicants had found an upward angle of 25° to be advantageous when combined with a 10° toe-in, the patent, after a quick reference to the possibility of mounting the detector at any position between rail height and journal-box height (which would encompass any upward angle from zero to something approaching 90°) diverts attention from the rail-level mounting position, which was actually preferred in use because it complied with clearance requirements, by concentrating its praise on viewing in a *horizontal plane,* which would necessarily involve mounting the detector at journal-box height ("the plane of the journal box").

Clearly the effect of this disclosure and discussion, whatever its intent, was not to reveal, but to conceal and obscure, the upwardly inclined viewing angle of 25° which was in fact the best mode the applicants had "contemplated" and which their employer, the patent owner, had in fact recommended, and continues to recommend, for all of its commercial installations.

Clearly the applicants did not comply with their statutory duty to disclose the best mode which they contemplated of carrying out their alleged invention, and the entire patent would have to be held invalid on this account, quite apart from the obviousness ground on which the decision of the Court below was based.

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the quotation read, "For example, detection of *direct sunlight and* sun reflections is less likely with the horizontal-plane viewing," and the deletion of the next sentence (so as to omit its true, but damaging-to-plaintiff's-contentions-in-the-case, admission that "in slant-aspect viewing the background very often is sky.")

2. Detectors Mounted as Called for in Claim 6—Mounted in a Low Position and Aimed at an Upward and Inward Angle—Were Offered for Sale and Sold by Servo, and Were in Commercial Use by Railroads Which Had Leased or Purchased Them, More Than a Year Prior to the First Disclosure of That Mounting Position and Those Aiming Angles to the Patent Office as a Part of the Patentees' Alleged Invention.

This mounting position was arrived at through adjustments made on detectors on the Chesapeake & Ohio and Reading railroads in the spring of 1957. It was thereupon adopted as standard by Servo, and Servo detectors so mounted were sold (or leased) and installed and used commercially for their intended purpose of detecting hot-boxes* more than a year prior to the filing by Servo, on June 30, 1958, of the continuation-in-part application (4.188-4.203) in which such a mounting was first disclosed.

The claim is accordingly invalid under 35 U. S. C. § 102(b) and *Muncie Gear Co.* v. *Outboard Co.*, 315 U. S. 759 (1942).

Petitioner's Argument Based on the Historical Facts Is Without Merit

Under Point I of the Questions Presented, petitioner urges that certain historical facts, which it characterizes as objective criteria of invention, virtually compel a holding that its patent is valid.

The fallaciousness of this argument can be shown in gross by pointing out that the same argument was advanced by petitioner in a pretrial motion for summary judgment seeking an injunction under claim 1 of this patent, the claim

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*Reading installation: 4.17-4.18, 4.66, 4.97, 4.125-4.126, 4.259, 4.261.

Boston & Maine installation: 4.36, 4.130-4.131, 4.253-4.254.
Norfolk & Western installation: 4.84-4.85, 4.255.
Southern Railway purchase: 4.147, 4.155, 4.172.

directed to anything other than end-on viewing, a claim now admittedly unsustainable.*

Even if taken at face value, the fragments of historical "fact" listed by petitioner do no more than to suggest the possibility that something inventive was done some time by someone in the field of hot-box detection—but this is a far cry from indicating, let alone establishing, that any thing inventive was involved in choosing a suitable place in which to mount a hot-box detector.

But the historical "facts" listed should not be taken at face value.

Despite the extent to which the railroads were plagued by hot-boxes and train wrecks caused by overheated journals, they were more interested in the *prevention* of hot-boxes than in their detection. The ultimate response of the Association of American Railroads to the suggestion (by a man named Fattor) of a hot-box detector mounted and aimed in precisely the manner called for in Servo's claim 5 five years before the arrival on the scene of Servo's patentees (2.66, 2.70, 2.83) was to change the name of its hot-box committee in such a way as to make clear it was neither interested in assisting nor authorized to assist individuals in the practical development of such an idea (2.59). Subsequently (about a year after Fattor's oral presentation to the committee and about four years before any action by Servo's patentees), the Association eliminated the committee entirely because of the feeling among railroad people that more time, energy and money ought to be directed toward the prevention of hot-boxes rather than the detection of them after they occurred (2.333-2.334).

Petitioner's references to General Electric's early activities cast no light whatever on the obviousness or un-

*Claim 1 has been withdrawn from suit, though not formally disclaimed.

obviousness of the mounting with which the patent in suit is concerned. General Electric did at one time defer for a time further work on a hot-box detector. There were good reasons for this. Prominent among them was the paradox that although the hot-box problem was then reported to be costing the railroads millions of dollars annually, the railroads were unwilling to make a modest investment in the development of an infrared detector (2.318-2.319).

It is clear that inability to choose a suitable mounting position had nothing to do with General Electric's temporary discontinuance of its work. For General Electric had selected the top of the side of the journal box as a suitable target and had designed a mounting for the detector which enabled it to scan the side of the box from the same journal-high, toed-in position which the present patent discloses as the full equivalent of its upwardly angled mounting.

Under Point 2, petitioner complains that the Court of Appeals disregarded all the findings of the Master and the District Court. The best answer to this is that of the Court of Appeals:

> "Thus the Servo '309 patent is in no sense a basic or pioneer patent; it does not purport to have originated the hot box detector as such. Rather, it teaches the position in which such a detector should be placed and the target at which it should be aimed in order to achieve a commercially feasible permanent installation which avoided certain problems inherent in the prior art."
>
> * * * *
>
> "Thus, the question for the court is whether the discovery of this position as disclosed by the claims of

the patent constitutes invention. We hold that it does not.

"This answer is not contingent upon resolving conflicting testimony, since the basic facts are not seriously in dispute. We simply hold that the standard of invention as applied by the master and the district court is not up to the legal standard required by the governing statute, 35 U. S. C. A. § 103. See *Great Atlantic & Pacific Tea Co.* v. *Supermarket Equipment Corp.*, 340 U. S. 147, 153, 71 S. Ct. 127, 95 L. Ed. 162 (1950)" (A4-A5).

CONCLUSION

This case involves no unusual questions of law and was rightly decided. Accordingly, the petition should be denied.

Respectfully submitted,

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STATUTES CITED

35 U. S. C.:

§ 102. *Conditions for patentability; novelty and loss of right to patent*

A person shall be entitled to a patent unless—

* * *

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of the application for patent in the United States,

* * *

§ 103. *Conditions for patentability; non-obvious subject matter*

A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

§ 112. *Specification*

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same, ***and shall set forth the best mode contemplated by the inventor of carrying out his invention.*** (Emphasis added)

* * *